



**McMaster University  
Medical Centre**

# ENCASEMENT PROJECT

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SPECIFICATIONS MANUAL

OCTOBER 2005

**McMaster University Medical Center**  
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## SECTION 1 – GENERAL INFORMATION

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### **1.0 Description of the Project**

Hamilton Health Sciences (“HHS”, “Owner”) is the operator of McMaster University Medical Center, located at 1200 Main Street West, Hamilton, Ontario, (“MUMC”).

MUMC’s asbestos location survey has established the presence of chrysotile asbestos as an ingredient in sprayed-on fireproofing (concentration range is 5% to 10%) used in the construction of MUMC. These asbestos containing materials (“ACM’s”) are found within the four interstitial spaces (M1, M2, M3, M4), the mechanical area M5, and the mechanical penthouse on the 6<sup>th</sup> level.

Hamilton Health Sciences (“HHS”) has decided to coat (or “encase”) all accessible asbestos-containing sprayed-on fireproofing (“asbestos fireproofing”) within the interstitial spaces of MUMC, the mechanical area M5, and the mechanical penthouse on the 6<sup>th</sup> level, with an encasement coating product system (“encasement coating”) that has been developed and approved specifically for application over asbestos-containing materials (hereafter, called “the Project”). “Accessible” fireproofing means any fireproofing that can be accessed by a worker on existing platforms or walking surfaces or with scaffolding, and which can be coated with normal spray equipment, including but not limited to extension wands, swivels etc. No stationary materials/equipment (ducts, catwalks etc.) are to be moved/removed to access fireproofing.

HHS is administering the Project. HHS intends to select and engage a Contractor to supply all Labour, materials, services and supervision necessary for undertaking and completing the Project (the Contractor’s work is hereafter called “the Work”). All encasement coatings will be supplied to the project at HHS’s cost.

A summary description of the Work to be performed by the Contractor is provided below. Please note that this summary is not necessarily an all-inclusive description of the Work, and is provided only for the purpose of convenience and ease of understanding.

#### ***Summary of the Work to be performed by the Contractor:***

- (a) Build asbestos entry and decontamination chambers at points where the Contractor’s workers will enter and exit the areas to be encased, as specified in this document.
- (b) Provide work lighting, vacuums, spray equipment, all necessary tools and asbestos-related supplies and equipment needed to perform the Work.
- (c) Provide all material handling services and equipment necessary for conveying drums of encasement coatings to the actual Work areas.
- (d) Removal and disposal of all wastes generated by the Project, including drums.
- (e) Vacuum all visible asbestos fireproofing debris where encountered and generated by the Project Work.

- (f) Unscrew and remove all corrugated decking (removable corrugated metal deck panels) from floors of the interstitial floor quadrants to gain access to lower beams covered with asbestos fireproofing.
- (g) Protect selected equipment, devices, and fixtures located in the Work areas that might otherwise be damaged by being covered with the encasement coatings.
- (h) Protect asbestos fireproofing from damage during the course of performance of Work by the Contractor.
- (i) Encase all asbestos fireproofing on structural steel (including structural steel that can be accessed beneath the floor decking following removal of corrugated decking), and over-sprayed areas of the ceiling deck surfaces, by spray application of the encasement coatings.
- (j) Replace and re-screw all corrugated decking back in place with standard screw size.

## 2.0 Description of Areas to be Completed

This Work is expected to commence on or around November 1, 2005 and is expected to be completed by June 2006. The areas that require encasement constitute approximately 30% of the total floor area identified as interstitial or mechanical spaces within the facility that contain asbestos fireproofing. The attached schedule (below) indicates the areas and amount of Work necessary to complete these areas.

### 2.1 Floor Areas

Floor areas for the project zones have been estimated as follows:

QUADRANT	SPACE (sq. ft.2)	Percentage to be completed				
		Decking Up (%)	Vacuuming (%)	Spraying (Primer) (%)	Spraying (Sealer) (%)	Decking Down (%)
<i>M2Q1</i>	80,415	0	50	0	0	100
<i>M2Q4</i>	73,235	0	70	0	86	100
<i>M3Q1</i>	72,241	100	100	100	100	100
<i>M3Q2</i>	65,613	95	95	95	95	95
<i>M3Q3</i>	70,032	0	100	1	69	100
<i>M5</i>	87,152	N/A	97	97	97	N/A
<i>M6</i>	89,914	N/A	100	100	100	N/A

## SECTION 2 – ROLE OF CONTRACTOR

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The Contractor shall provide all necessary labour, expertise, supervision, materials, equipment, services, mobilization and transportation, taxes, fees, permits, licenses, duties, except GST, supplies, and other things necessary to complete the Work, all in accordance with applicable governmental and regulatory requirements, and the requirements set out in this specification.

## **SECTION 3 – PROJECT PLANNING, MANAGEMENT AND QUALITY**

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### **1.0 *Post Award Project Meeting***

- 1.1 Within 48 hours of notification of Contract award, one or more senior management representatives of the Contractor, the Contractor's project manager, and the Contractor's designated on-site project supervisor, shall attend a meeting at MUMC, with representatives of the Owner and/or Owner's Consultant, for the purpose of reviewing the preliminary project plan and the sequence of events leading to mobilization and commencement of the Work.

### **2.0 *Project Safety Plan Formulation***

- 2.1 During the Post-Award Project Meeting, the Contractor, Owner and/or Owner's Consultant shall review safety requirements for the project, and the established safety programs and practices of the Contractor, and these shall be integrated by the Contractor in the form of a documented Project Safety Plan, which shall be implemented by the Contractor.

### **3.0 *Asbestos Green Card Training***

- 3.1 As soon as practicable following project award, the Contractor and Consultant providing 'Green Card' Training shall arrange for delivery of Green Card training to all personnel of the Contractor requiring such training. It is anticipated that this instruction shall take place within 10 business days. Training session is approximately 4 hours in duration.

### **4.0 *Encasement Coating Application Methods Training***

- 4.1 As soon as practicable following completion of Green Card training, the Contractor and Owner shall arrange for application methods training to all personnel of the Contractor.
- 4.2 Prior to training taking place, the Contractor shall mobilize to the work zone a limited amount of equipment and supplies required for the training, which shall be identified by the Owner. Such equipment and supplies shall not be beyond those described in this specification for the Work.
- 4.3 All coatings to be applied as outlined in Schedule 1.

### **5.0 *Project Planning Session***

- 5.1 Prior to the primary mobilization and commencement of the Work, the Contractor shall attend a project planning session at MUMC. This project planning session shall consist of any final pre-project planning work and discussions between the Contractor, Owner and/or Owner's Consultant, and potentially the Ministry of Labour. All personnel of the Contractor who shall work on the Project at the time

of Project commencement, and representatives of the Contractor's senior management, shall attend the session.

## **6.0 Weekly Project Meetings**

6.1 From the time of the Project commencement until completion, the Contractor's on-site supervisor, and if necessary, project manager, shall attend a weekly project meeting, to be held at MUMC. The project meeting shall typically last 1 hour and will be chaired by the Owner or Owner's Consultant. The typical agenda for the weekly project meetings will be as follows:

### HHS Encasement Project Pro-Forma Project Meeting Agenda

1. Welcome, Introductions, Review of the Agenda, Approval of previous Minutes
2. Pace, Quantity of Progress Report – Contractor and Project Manager
3. Quality of Work Report – Project Manager and Owner
  - 3.1 Housekeeping
  - 3.2 Thickness and Uniformity
  - 3.3 Raw Material and Equipment Condition and Status
  - 3.4 Test Results (Air Sampling, Adhesion/Cohesion, etc.)
4. Project Safety Report
  - 4.1 Accidents, Incidents and Unsafe Occurrences
  - 4.2 Inspection Reports
5. Work Plan and Schedule
6. Other Items
7. Next Meeting – Date, Time and Location

## **7.0 Project Supervision and Inspection**

7.0 The Contractor's on-site supervisor shall make daily inspections of the Work by the Contractor's personnel, to ensure completion of the work in accordance with specified quality and schedule requirements.

7.1 Representatives of the Owner and/or Consultant and governmental enforcement agencies are to be given free unencumbered access to the work area at all times. The Contractor shall lend assistance to, and cooperate with these parties.

7.2 The Contractor shall provide a full time site supervisor. The site supervisor, or his/her alternate, shall be physically present at the job site, shall be accessible at all times to workers working in the interstitial space, and shall either (a) remain inside the interstitial space at all times while work is being performed; or (b) shall make entry into the interstitial space no less frequently than once every 1.5 hours, and at such times, shall make a complete inspection of the work and shall confirm the presence and safety of all of the Contractor's workers.

## **8.0 Weekly Project Progress Reports**

- 8.0 During the course of the Work, the Owner or Owner's Consultant shall regularly make and record observations with respect to pace and quantity of the work performed, schedule compliance, quality of work (including housekeeping, cleanliness, hospital nosocomial infection prevention, thickness and uniformity of application, raw material and equipment integrity, adhesion-cohesion testing, and moisture conditions), and job safety. These observations shall be reported at the weekly project meetings.

## **SECTION 4 – EXECUTION OF THE WORK**

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### **1.0 Type III Application of Encasement with Variance**

- 1.1 Entry into the interstitial spaces is typically carried out under Type 2 Asbestos Work Operations, within the meaning of O. Reg. 278/05. The spray application of the Fibertech Encasement Product is classified as a Type 3 Asbestos Work Operation under the same regulation. A variance will allow this work to be carried out with the following substitutions:
- 1.2 Instead of all the items being removed from the work area or being covered with polyethylene sheeting, all surfaces in the work area will be cleaned up using HEPA vacuuming. Drop sheets of polyethylene will be draped over some surfaces to protect from over spray of primer, but not as a measure of any variance requirement. All items being removed from the interstitial/mechanical space will be dampened, wiped or HEPA vacuumed prior to doing so.
- 1.3 Instead of constructing a Type III enclosure with 3-stage decontamination facility, the walls of the interstitial/mechanical space will form the enclosure. Where walls do not totally enclose the work area, polyethylene sheeting will be installed to create an enclosed work area.
- 1.4 Instead of disabling the ventilation system, all openings to and from the ventilation system will be sealed off with polyethylene sheeting and duct tape.
- 1.5 Instead of showering in a three stage decontamination facility, before leaving the area, workers will decontaminate their protective clothing and footwear using a damp cloth or by HEPA vacuuming in the first decontamination room (dirty room). Once this step is complete, workers will enter a second room where protective clothing will be removed and placed in a waste bag. When this is complete, workers will enter the occupied work area and remove their respirators then proceed to the nearest washroom for the washing of their hands and face.



- 1.6 In terms of required respiratory protection, as a minimum, all workers within the projected area will use NIOSH-approved, half-mask, air purifying respirators with HEPA (P100) cartridges for protection against asbestos fibres and other particulates.
- 1.7 Instead of damp wiping and HEPA vacuuming, the work area and items being removed from the area will be damp wiped or HEPA vacuumed upon completion of the work and prior to exiting the interstitial space project area.
- 1.8 All procedures and requirements of the HHS ‘Green Card Training’ program are to be adhered to at all times. Failure to abide by these rules and regulations and O. Reg. 278/05 may result in the dismissal of the Contractor and/or negligent workers employed by the Contractor.

## **2.0 Construction and Removal of Type II Asbestos Entry and Decontamination Chambers**

- 2.1 Prior to commencement of work within the Project zones, the Contractor shall construct Type II asbestos entry and decontamination chambers (“chambers”) at points where the Contractor’s workers will enter and exit the work zones.
- 2.2 The Contractor shall dismantle and remove the chambers following the completion of each work area.
- 2.3 Chambers shall be wet wiped or HEPA vacuumed at the end of each day of use, or more often, as necessary, to remove any debris or dirt.

## **3.0 Provision of Work Lighting, Fire Extinguishers, Spray Equipment, Tools, Asbestos Abatement Supplies and Equipment**

### **3.1 Portable Lighting**

- 3.1.1 The Contractor shall supply, and locate within the required Project zones, where required portable construction task lighting providing sufficient levels of illumination to permit the Contractor’s personnel to carry out their work generally in a safe and productive manner, and to permit the Contractor’s personnel to apply the encasement coatings to the requisite degree of uniformity and thickness. All workers shall be equipped with flashlights in good working order when working in the interstitial spaces.

### **3.2 Fire Extinguishers**

- 3.2.1 The Contractor shall supply, and locate within the Project zones, in close proximity to its workers, portable ABC fire extinguishers at a minimum ratio of one fire extinguisher per worker, performing spray application of the encasement coating. The intent is for fire extinguishers to be readily accessible to the Contractor’s personnel in the event of fire caused by task

lighting or any other cause, and to enable personnel to escape from the Project zones in case of fire.

- 3.2.2 The Contractor shall supply, and permanently locate within each chamber for so long as each chamber is in place, one portable ABC fire extinguisher at each entrance or exit to or from the chamber.
- 3.2.3 The Contractor shall inspect every fire extinguisher monthly, and complete an inspection card, affixed to the fire extinguisher, to verify that the fire extinguisher is fully charged.

### **3.3 *Spray Coating Equipment***

- 3.3.1 The Contractor shall supply, maintain, and use spray coating equipment, and all necessary spray coating accessories to apply the encasement coatings to the proper mil thickness and to access all accessible surfaces.
- 3.3.2 The following spray equipment is recommended:
  - 1. **Sprayer:** P “Graco” electric airless sprayer model: Ultra Max 1095 (for 2 guns), or Ultra Max 1595 (for 3 guns); or “Titan” model 1140i (for 2 guns); or “SprayTech” model EPX 2505 (for 2 guns)
  - 2. **Hose:** 3/8<sup>th</sup> inch (9.53mm) inside diameter (minimum)
  - 3. **Guns:** Graco Silver or Golden Hydra-Mastic guns (or equal)
  - 4. **Tips:** Use reverse-to-clean type tips. For primer use 0.017 to 0.023 size tips. For top coat use 0.021 to 0.025 size tips.
  - 5. **Equipment cleanup:** Use soapy warm water. Immediately wipe surfaces not to be coated to prevent drying.

### **3.4 *Communication Equipment and Flashlights***

- 3.4.1 The Contractor shall supply and maintain hand-held two-way radios, for use by the Contractor’s personnel, to permit communications amongst the Contractor’s personnel and with the Owner or Owner Consultant. Sufficient numbers of two-way radios shall be supplied so that two-way radios are in possession of each of the Contractor’s on-site supervisor(s) and foreperson(s), and to the Contractor’s other workers in a ratio of at least one radio per three workers. The intent is that each of the Contractor's crews has dedicated access to a radio. The Owner shall specify the operating frequency for the two-way radios.
- 3.4.2 The Contractor shall supply each of its personnel with a flashlight, which shall be maintained in operation condition, and kept with each worker at all times while in the work zone.

### **3.5 *Tools***

3.5.1 The Contractor shall supply and maintain all tools and equipment required by the Contractor for performance of the Project.

### **3.6 *Asbestos Abatement Supplies and Equipment***

3.6.1 The Contractor shall supply and maintain all necessary asbestos abatement supplies and equipment necessary for completing the Contractor's work on the Project, including, but not limited to, personal protective equipment, HEPA vacuums, drop sheeting, etc.

## **4.0 *Material Handling, Storage, and Spill Control***

4.1 The Contractor shall provide all material handling services, labour and equipment necessary for conveying its own equipment, drums of encasement coatings, and Project wastes.

4.2 The Owner shall provide space at the Project site for temporary storage of encasement coatings, and the Contractor's equipment and supplies. The Owner shall identify such storage spaces to the Contractor, and shall impose any condition on storage as necessary, including maximum quantities, and security requirements.

4.3 The Contractor shall ensure that encasement coatings are kept sealed to prevent coatings from unnecessary drying, and that waste encasement coating is kept to a minimum. All inner drum liners shall be completely expunged of all their contents before being disposed.

4.4 The Contractor shall be responsible for containment and clean-up of any spilled encasement coatings, restoration and repair of building surfaces, materials, systems and equipment adversely affected by any spilled encasement coatings, and replacement of any building systems, equipment or fixtures that cannot be satisfactorily restored or repaired. All fluids generated or transported in the space shall be stored/transported in sealed containers to avoid spills and leaks.

## **5.0 *Removal and Disposal of Project Wastes***

5.1 The Contractor shall remove and dispose of all wastes generated by the Contractor on the Project.

5.2 The Contractor shall remove and dispose of, or ship for recycling, all empty encasement coating drums and packaging materials.

5.3 The Contractors shall remove and dispose of all waste personal protective equipment utilized by the Owner and/or Owner's Consultant in connection with the Project.

- 5.4 The Contractor shall execute the out-loading of waste from the work area to the temporary containment area on the Owner's property on a routine basis throughout the project.
- 5.5 Packaging, handling, and conveying of all wastes identified herein, and/or generated by the Contractor, shall be removed and disposed of in accordance with all applicable laws and statutes.
- 5.6 All asbestos wastes shall be placed into yellow 6 mil polyethylene bags labeled as containing asbestos waste and sealed for airtight closure. Asbestos contaminated waste that will tear polyethylene bags shall be disposed in another manner acceptable to the Owner and/or Owner's Consultant, such as placement into cardboard containers and sealed for airtight closure, or wrapped in clear polyethylene and taped to seal all seams. Containers shall be labeled as containing asbestos, and damp wiped as transferred through the waste load out.
- 5.7 Asbestos waste containers shall be cleaned of gross contamination in the work area using a HEPA vacuum or wet wiping. The decontaminated bags shall then be passed out of the interstitial/mechanical space/work zone for disposal.
- 5.8 Wastes shall be transferred to a waste disposal location designated on site by the Owner.
- 5.9 Asbestos-containing bags shall be carried in fiber bins or covered carts to facilitate transfer of asbestos waste to the designated disposal bin.
- 5.10 Any wastewater containing asbestos, including that from the decontamination area shall be filtered using a microspore filter. Filters and residues, when disposed of, must be treated as asbestos waste.

#### **6.0 *Vacuum Visible Asbestos Fireproofing Debris***

- 6.1 The Contractor shall HEPA vacuum all visible asbestos fireproofing debris in the project work zones encountered by, or generated by the Contractor, during the Project.
- 6.2 The Contractor shall HEPA vacuum all horizontal surfaces on which loose fireproofing is present, prior to applying any encasement product.

#### **7.0 *Removal and Replacement of Corrugated Decking***

- 7.1 In the work zones, the Contractor shall unscrew all corrugated decking (removable corrugated metal deck panels) from floors, and stack neatly in the center of the removed track, screwing top sheet down to the Q-deck to secure the

pile. This will facilitate access to lower beams beneath corrugated decking and Q-decking covered with asbestos fireproofing, for encasement by the Contractor.

- 7.2 After the Contractor has encased accessible lower beam surfaces and the area has been cleared and inspected for deficiencies, the Contractor shall replace and re-bolt all corrugated decking, ensuring that all screws are replaced with a standard screw, the size and type to be specified by the owner. The replacement of decking shall only be completed when all/any deficiencies have been corrected to the satisfaction of the Owner or Owner's Consultant.

#### **8.0 *Protect Selected Equipment, Devices, Fixtures, and Floor Deck Surfaces in the Work Zones***

- 8.1 Prior to spraying encasement coating onto asbestos fireproofing, the Contractor shall place drop sheets or an equivalent over any exposed heating/cooling coils, valves, solenoids, electrical junction boxes, gauges, dials, mechanical system control devices, and equipment tags, as necessary to prevent encasement coating from being sprayed onto such items.
- 8.2 The Contractor shall exercise care when spraying encasement coating onto ceiling decks and onto upper portions of structural steel members, to prevent encasement coatings being sprayed onto lights fixtures or bulbs.
- 8.3 The Contractor shall protect overspray and possible asbestos debris from accumulating at the base of trusses where diagonal truss sections meet decking by protecting these areas with a minimum 2' x 2' protective covering.
- 8.4 The Contractor shall clean and remove excessive encasement coating from any items identified in 8.1, 8.2 or 8.3 onto which encasement coatings are sprayed due to the failure of the Contractor to provide adequate protection, where overspray interferes with the normal function of the components noted in these sections.

#### **9.0 *Protect Asbestos Fireproofing from Being Damaged by the Work of the Contractor***

- 9.1 The Contractor shall take measures to prevent asbestos fireproofing from being damaged by the Contractor's work activities. These preventive measures may include, but need not be limited to:
- (a) Feeding spraying equipment hoses along pathways within the work zone formed by existing mechanical equipment, abandoned cable trays, and mechanical hangers;
  - (b) Placement of protective mats blankets or shrouds over asbestos fireproofing to prevent hoses, equipment or personnel rubbing against and damaging the asbestos fireproofing.
  - (c) Working systematically and organizing work activities so that disturbance and damage to recently applied membrane is minimized.

- 9.2 Should the Contractor cause any damage to asbestos fireproofing which, in the opinion of the Owner and/or the Owner's Consultant, compromises the fire protection of any part of any structural steel member, the Contractor shall restore the damaged areas using a cementaceous non-asbestos spray or trowel applied fireproofing of a type acceptable to the Owner and/or Owner's Consultant.

#### **10.0 Encase all Asbestos Fireproofing on Structural Steel**

- 10.1 The Contractor shall coat asbestos fireproofing with encasement coatings, in the manner described in Section 10, and in accordance with the techniques described in Schedule T1 of this Specification.
- 10.2 All accessible fireproofing overspray on ducts, duct hangers, walls, etc. shall be coated with a 10-12 wet mil thickness of topcoat-sealer. In addition, where there are noticeable breaches to asbestos-containing elbows, bonnets, sleeves, etc., the contractor is also required to coat these areas with a 10-12 wet mil thickness of topcoat-sealer.
- 10.3 All man-made holes in the top of beams where the beam and ceiling deck interface that contain loose fireproofing shall be stuffed with fiberglass insulation or an equivalent, on both sides of the beam surface, prior to encasement application. In addition, any large (greater than 3'' wide) voids between the ceiling deck and beams shall also be stuffed with fiberglass insulation (such conditions generally only exist on the 6<sup>th</sup> level).
- 10.4 Surfaces of the ceiling deck that have been over-sprayed with asbestos fireproofing shall be encased by spray application of the encasement sealer over top of asbestos fireproofing to a wet mil thickness of between 10 and 12 mils, where less than 50% of the decking is covered with overspray. Ceiling decking surface areas that are free of over-sprayed asbestos fireproofing need not be coated with encasement sealer, and if coated, need not be to a wet mil thickness of between 10 and 12 mils. Where ceiling deck is substantially (more than 50% of surface) or totally covered with fireproofing, both encasement primer and sealer shall be applied at a rate of 12 –20 wet mils each.
- 10.5 Surfaces of structural steel covered with asbestos fireproofing shall be encased by initial spray application of encasement primer to a wet mil thickness of between 12 and 20 mils, followed by subsequent spray application of encasement sealer to a wet thickness of between 12 and 20 mils. A time period of 24 hours, or less if approved by the Owner or Owner's Consultant, shall elapse between the application of encasement primer to a surface, and the subsequent application of encasement sealer.
- 10.6 Within interstitial spaces, the lower half to two thirds of each diagonal truss shall be encased with a primer and sealer application of 30-40 wet mils each.

- 10.7 In Section 10.5 “surfaces of structural steel covered with asbestos fireproofing” includes all surfaces of structural steel located above Q-deck and corrugated decking, and those surfaces of structural steel located beneath Q-decking that can be accessed by removal of corrugated decking, and encased by the use of appropriate equipment.
- 10.8 Achievement, during spray application, of high degree of uniformity in coating thickness is critical for (a) the effectiveness and longevity of the encasement coating system, and (b) completion of the Project within the budget allowance provided for procurement of the encasement coatings. Therefore, the Owner or Owner’s Consultant shall regularly measure, record, monitor and report on the degree to which the Contractor’s application of the encasement coating is within tolerances established by this specification. Where the Contractor fails to achieve specified tolerances, the Owner or Owner’s Consultant shall advise the Contractor. Where the Contractor applies coating to a thickness less than the specified thickness, the Contractor shall be required to spray additional coating on the affected areas, and no additional compensation shall be paid to the Contractor for such rework. Where the Contractor applies the coating to a thickness greater than the specified thickness and this occurs with regularity, the Contractor may be deemed to be in breach of the contract regulations.
- 10.9 The Contractor is responsible for reviewing and making good any and all deficiencies to the encasement coating in partially completed quadrants, including the vacuuming of asbestos debris, replacement of decking, removal of protective coverings, etc. and any other existing conditions at the time of contract execution within the partially identified quadrants in this specification. All partially completed areas are to be completed by the Contractor to the standards and requirements of this specification.

### ***11.0 Type II Entry and Exit Procedures***

- 11.1 Entry, and any manner of work within work zones containing non-encased asbestos fireproofing, is classified for purposes of this specification as a Type II Asbestos Work Operation, within the meaning of O. Reg. 278/05, and shall be carried out in accordance with the requirements for Type II Asbestos Work Operations as set out by O. Reg. 278/05 and the variance for the project.
- 11.2 Prior to entry to the work zone, personnel shall pass into the entry and exit chambers (“clean” and “dirty” rooms) built to separate the work zone from the non-work zones of MUMC. There, they shall don protective suits and put on respiratory equipment, prior to entering these decontamination rooms. Personnel shall then proceed into the work zone.
- 11.3 When leaving the work zone, personnel shall wet wipe hard hats, coveralls and boots within the “dirty” room. Following decontamination of protective wear, personnel shall step into the “clean” room. Where they shall roll off their

protective suit and place protective suit either in an impermeable bag for re-use or for disposal. Following these steps, workers shall exit the clean room and enter normal occupied areas (outside the work zone). The project variance will specifically outline entry and decontamination measures and when finalized will supercede all measures that may be made in this specification.

- 11.4 Respirators will be removed outside the interstitial space identified as a work zone.
- 11.5 Upon leaving the work zone, personnel shall go directly to a designated washroom to wash hands and face and to wash respirator face pieces.

## ***12.0 Work in Quadrants***

- 12.1 The Contractor shall complete work in the sequence and manner prescribed by the Owner or Owner's Consultant.

## **SECTION 5 – ASBESTOS CONTROL AND SAFETY REQUIREMENTS**

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### ***1.0 Asbestos Warning Signage***

- 1.1 Doors accessing the zone being encased shall be labeled by the Contractor to indicate that asbestos work is being carried out, and that access is prohibited to authorized personnel. Entrances from the exterior stairwells into the interstitial space that are not being used by the Contractor to perform work in a particular zone shall be sealed with a polyethylene barrier on the interstitial space side, prior to commencing the encasement work. Door signage and seals shall be removed upon completion of all work within the zone, subject to the approval of the Owner or Owner's Consultant.
- 1.2 Following visual inspection and verification of completion of Work by the Owner and/or Owner's Consultant, the Contractor shall remove the polyethylene barriers from the affected doorways. Such wastes shall be rolled up and placed in asbestos waste bags. When asbestos waste bags are sufficiently full, these bags shall be tied closed using duct tape. Wastes shall be removed in accordance with the requirements of O. Reg. 278/05 and this specification.

### ***2.0 Signing In and Out of the Work Zones and MUMC***

- 2.1 All persons entering the work zones during encasement work shall sign in and out of the work zones, in a manner permitting identification of the person, and the times of each entry and exit, on a sheet posted at the entrances being used by the Contractor.
- 2.2 The Contractor's personnel shall sign in and out of MUMC on a daily basis following procedures to be established by the Owner or Owner's Consultant.



### **3.0 Personal Protective Equipment**

- 3.1 Workers in the work zones shall use and wear at least half-face, negative pressure, air-purifying respirators equipped with HEPA (P100) filters. Respirator exchange shall be made only outside the work zone and only after following standard decontamination procedures for all other protective equipment being worn or used.
- 3.2 All respirators face pieces and filter cartridges shall have an approval number granted by the National Institute for Occupational Safety and Health (NIOSH) or the Mine Safety and Health Administration (MSHA).
- 3.3 Respirators shall be fit checked each time they are donned by a worker. "Fit check," means a negative or positive pressure check of a respirator's fit, performed in accordance with the respirator manufacturer's instructions.
- 3.4 A worker required to wear an air-purifying respirator must be clean-shaven where the respirator seals with the face. The Owner or Owner's Consultant shall have authority to direct any worker to leave the work area to shave without penalty to the Owner.
- 3.5 All respirators must be inspected by the user prior to each use and maintained in good operating condition and state of repair in accordance with manufacturer's instructions.
- 3.6 The user must clean respirators after each use.
- 3.7 Persons in the work zones shall wear hooded coveralls and safety footwear that are impervious to, and do not retain asbestos fibers. Where the hazard of eye and/or head injury has been identified, safety eye wear and/or protective head coverings shall be used. The characteristics and manner of use of all personal protective equipment for purposes of this work shall be subject at all times to the approval of the Owner or Owner's Consultant.

### **4.0 Construction Safety**

- 4.1 Failure of a Contractor or any worker to comply with occupational health and safety laws and regulations applicable to the work may result in temporary or permanent removal from the Project by the Owner or Owner's Consultant without recourse or compensation to the Contractor or worker by the Owner or Owner's Consultant. In the event of any dispute over the application or interpretation of such laws or regulations with respect to the work, the opinion of the Owner, or Owner's Consultant as representative of the Owner, shall prevail.

- 4.2 Confined or restricted space entry requirements set out by regulations under the *Occupational Health and Safety Act* shall be followed should the Work necessitate confined or restricted space entry.
- 4.3 Prior to commencement of work within the interstitial spaces, the Owner will identify and communicate to the Contractor and workers any hazards present in the interstitial space, including those related to the generation of a hazardous atmosphere (e.g., piping of chemicals.) This will be done in writing and will include any necessary procedures and/or measures for the control of those hazards.
- 4.4 Prior to commencement of work, the Contractor shall file a Notice of Project with the local office of the Ontario Ministry of Labour. The Contractor shall be identified on the Notice of Project as the “Constructor”, and the Contractor’s site supervisor shall be identified on the Notice of Project as the “Supervisor”.
- 4.5 The Contractor acknowledges and accepts responsibility as the “Constructor” for the Project under the *Occupational Health and Safety Act*.

#### **5.0 *Health and Safety Qualifications of Contractor’s Personnel***

- 5.1 Prior to commencement of the Work, all workers of the Contractor are required to be in possession of MUMC “Green Cards” issued in accordance with MUMC Site Asbestos Management Plan. The Contractor shall bear costs for its workers’ time and personal expenses associated with such training, and shall also supply all personal protective equipment required for personnel attending such training. Should the Contractor require any additional Green Card training of its personnel during the course of the Project due to staff turnover or other factors, the Contractor shall notify the Owner or Owner’s Consultant, and the Owner or Owner’s Consultant shall deliver such training within 10 working days of the request being made. In such event, the Contractor shall bear costs for its workers’ time and personal expenses associated with such training. Courses must have a minimum of 6 attendees before they will be scheduled, but can be made up of workers from other projects or HHS employees requiring such training.
- 5.2 All site personnel of the Contractor having supervisory functions are required to be “competent persons” as defined by the *Occupational Health and Safety Act*.

#### **6.0 *Lock-Out and Tagging***

- 6.1 The Contractor shall be responsible for identifying, and ensuring shut off, disconnect, lock-out and tagging of all mechanical, electrical and other systems of the building serving the work zone that might endanger a worker. Need for the same shall be identified by the Contractor, prior to work in work zone, and reported on by the Contractor to the Owner or Owner’s Consultant. Where the Contractor requires the assistance of the Owner to affect shut off, disconnection,

or lock-out and tagging of systems, the Contractor shall advise the Owner of the same, and the Owner shall afford such assistance as is reasonable and necessary. The Owner will verify shut off, lockout and tagging, and take into possession and secure all keys and access codes for the locks utilized in locking out systems.

## **7.0 *Emergency Preparedness and Response***

- 7.1 The Contractor shall establish and maintain an alarm/notification system to permit personnel outside of the work zone to notify: (a) personnel inside the work zone of an emergency situation necessitating potential or actual evacuation from the enclosure; and (b) personnel outside of the enclosure of an emergency situation necessitating evacuation or provision of assistance. The alarm/notification system should, as a minimum, distinguish between medical emergencies and fire.
- 7.2 On each work shift, there shall be at least one person on site at all times for every twelve (12) workers, who is in possession of a valid standard first aid certificate and cardiopulmonary resuscitation certificate, acceptable to the Owner and Owner's Consultant.
- 7.3 The Owner or Owner's Consultant will notify the Contractor and workers within the work zone of any test of emergency alarm systems to be carried out within the building.
- 7.4 The Owner or Owner's Consultant shall clearly mark, and communicate to employees, an emergency escape route for personnel working inside the work zones. Emergency exits are currently marked with red fluorescent bulbs.
- 7.5 In the event of a slow (2 second per bell) fire alarm, workers are to gather at the nearest designated exit and await the "all-clear" (2 bells rung directly after each other following a period of silence). In the event of a full fast bell fire alarm, all personnel are to leave the work zones by exit in accordance with normal decontamination procedures, unless there are signs of smoke or fire. If there are signs of smoke or fire, regardless of whether or not an alarm has sounded, personnel shall exit the work area by means of the nearest emergency exit immediately wearing contaminated protective clothing.
- 7.6 All workers will be instructed in emergency procedures.

## **8.0 *Prohibitions***

- 8.1 Use of torches, open flame, or other forms of hot work is prohibited without a work permit to do so issued by the Owner.
- 8.2 Smoking, eating, drinking or chewing in the work zones is prohibited.
- 8.3 Smoking within the premises is prohibited.

8.4 Intoxication by alcohol or drugs, or suspected use of alcohol or drugs by any person on the Project during work will result in their permanent removal and discharge from the Project.

8.5 Compressed air shall not be used for cleaning or dust removal.

## **9.0 *Prevention of Nosocomial Infection***

9.1 The Contractor shall advise its workers that consumption of potentially stagnant water from domestic water services may be hazardous to health, and other workers shall not consume or wash with water from sources within MUMC other than those identified to the Contractor as being suitable for drinking or washing purposes.

9.2 In the performance of the Work, the Contractor shall take measures as necessary to avoid the generation and dispersal of dusts.

9.3 The Contractor's personnel shall enter and exit MUMC only at locations designated by the Owner, and shall only follow travel pathways designated by the Owner. The Contractor shall install anti-microbial walk-off mats at designated entry points, and the Contractor's personnel shall step onto and wipe the soles of their footwear on these walk-off mats prior to entering non-work zones.

9.4 The Contractor's workers shall avoid dusting or brushing off their clothing or equipment anywhere inside MUMC. Should dust removal be necessary, a HEPA vacuum or wet wipes are to be used.

9.5 Should any equipment, tools, or supplies of the Contractor be visibly dusty, the Contractor shall HEPA vacuum or wet wipe affected surfaces prior to bringing these items into MUMC.

9.6 The Contractor shall report to the Owner or Owner's Consultant any cases of severe flu, respiratory ailments, or pneumonia amongst any of its personnel working on, or who have worked on the Project at any time 21 days to the onset of symptoms. The Owner or Owner's Consultant may refer such cases to HHS Infection Control personnel for follow-up.

## **SECTION 6 – SITE SERVICES**

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1. The Owner shall permit the Contractor to mobilize a site trailer to the Project Site, if desired by the Contractor.

2. The Contractor's personnel shall be permitted to use only designated washroom facilities at MUMC.
3. The Owner shall install, at its own expense, a reasonable number of Contractor-supplied power panels in the work zones to permit the Contractor to obtain electrical power for its equipment, where required. Costs of electrical power associated with the Project shall be borne by the Owner.
4. The Owner shall designate on-site storage areas for encasement coatings, the contractor's supplies and equipment, and waste materials produced by the Project.
5. The Owner shall ensure that all stationary lighting in project areas are fully functional at all times.

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## **SECTION 7 – WORK SCHEDULE AND SEQUENCE OF COMPLETION**

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1. Time is of the essence in the completion of this Project. This Project is being carried out in order to encase the majority of the asbestos fireproofing in the work zones, and thereby render the work zones non-asbestos work areas (as of the time of tender, personnel working in the work zones are required to wear personal protective equipment and follow work procedures for Type II asbestos work operations, under the *Regulation respecting Asbestos in Construction Projects, and in Building and Repair Operations – made under the Occupational Health and Safety Act*).
2. Substantial and Total Performance of this work phase shall be achieved by June 2006.
3. The Contractor may carry out its work from 7:00am to 7:00pm in all work zones, except for work above the operating rooms. Work above the operating rooms may only be carried out from 7:00pm to 7:00am, or during scheduled shut-downs. Should the Contractor deem it necessary to conduct work in other work zones from 7:00 p.m. to 7:00 a.m., the Owner or Owner's Consultant shall grant or deny permission, and the Owner and Owner's Consultant may also establish terms and conditions to be met by the Contractor as a condition of granting permission.
4. Should the Contractor fail to meet the completion schedules set out herein, the Owner may, in its sole discretion, engage the services of one or more additional contractors to undertake and complete work as necessary in order to ensure that the specified work is completed on time. In such event, the Owner or Owner's Consultant shall issue a Change Order to the Contractor, deleting a defined portion of the Contractor's work, and the Contractor's compensation shall be reduced in an amount equal to the number of square feet of floor area covered by the Change Order, multiplied by the Contractor's stipulated price per square foot, applicable taxes and allowances, if any.

**“SCHEDULE 1”**  
**ENCASEMENT COATING APPLICATION METHODS**

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**1.0 PRODUCT STORAGE AND HANDLING**

- 1.1 Storage: Store materials between 40°F and 90°F with careful handling to prevent damage to products. Do not store for long periods in direct sunlight, at excessive temperatures or at temperatures below freezing.
- 1.2 Protection: Protect all materials from damage during transit, handling, storage, and installation.

**2.0 PROJECT CONDITIONS**

- 2.1 Do not apply materials unless surface to receive encasement system is dry.
- 2.1 The entire system shall be fully adhered to the surface on which it is applied. Voids left under the system by creating bridges are not acceptable.
- 2.2 Do not proceed with application of coating or sealing materials when surface temperature is less than 50°F. No coating system shall be applied if weather will not permit it to dry prior to exposure to precipitation or freezing.

**3.0 APPLICATION**

- 3.1 Primer Coat: Apply Fibertech F-50 (primer) using a sweeping motion, to achieve a final uniform thickness in the range of 12 to 20 wet mils (greater on trusses), according to conditions. Make angled passes first in one direction, and then perpendicular to the first passes. Allow Fibertech F-50 to dry to touch in 2 to 24 hours before applying any topcoat materials.
- 3.2 Sealer Coat: Apply FiberTech F-51 sealer to a wet mil thickness of between 12 to 20 mils (greater on specified trusses). Apply topcoat in two or more angled passes, with the second pass perpendicular to the first pass. Allow F-51 to dry to touch in 2-6 hours before applying additional materials. As the F-50 primer coat has already stabilized the surface, the use of gentle manual brushing after spraying the F-51 material can help to fill visible voids, if necessary, while conserving the use of materials.
- 3.3 The Contractor shall provide and use a range of spray nozzles providing a range of spray dispersion geometries to optimize application rates and prevent loss of coating by overspray. Generally speaking, primer is applied with a 319 tip, and topcoat-sealer is applied with a 321-323 tip size.
- 3.4 The finished encasement system shall be seamless and form a continuous, flexible jacket around the Asbestos Containing Materials (no voids or holes in finished coating surface). The Owner and/or Owner’s Consultant shall continuously inspect the surface of the applied encasement membrane to verify that the membrane is seamless, free of voids and holes, and continuous.

3.5 Any areas that do not meet the minimum standards for application as specified herein shall be corrected at the Contractor's expense.